Claims

1. (Previously presented) An imaging apparatus, comprising:

an electromagnetic pulse source;

a beam splitter splitting a pulse from the electromagnetic pulse source into a first portion and a second portion;

an X-ray source generating a beam in response to the first pulse portion, the beam directed toward an object for generating an X-ray object image; and

an X-ray time gate capturing the X-ray object image in response to the second pulse portion.

2. (Original) The apparatus of claim 1 wherein the electromagnetic pulse source comprises a laser.

3. (Previously presented) The apparatus of claim 2 wherein the laser produces a pulse having a width of about 10 – 30 femtoseconds and an energy of at least 125 – 250 mJ at a rate of about 100 – 250 pulses per second.

4. (Original) The apparatus of claim 1 wherein the X-ray source comprises a laser-produced-plasma X-ray source.

5. (Original) The apparatus of claim 1 wherein the X-ray source comprises a molybdenum target.

6. (Cancelled)

7. (Previously presented) The apparatus of claim 1 including an adjustable delay through which the second pulse portion travels to reach the X-ray time gate.

8. (Previously presented) The apparatus of claim 1 wherein the X-ray time gate comprises a Raman amplifier and the apparatus includes:

a Raman generator receiving the X-ray beam from the X-ray source and generating in response an imaging beam directed toward the object for generating an object image; and

a beam combiner combining the second pulse portion with the object image into a combined beam directed to the Raman amplifier, the amplifier responsive to the second pulse portion to capture the object image.

9. (Original) The apparatus of claim 8 including an adjustable delay through which the second pulse portion travels to reach the beam combiner.

10. (Previously presented) A method for producing an image of an object, comprising:

generating an electromagnetic pulse;

splitting the pulse into a first portion and a second portion;

generating an X-ray beam in response to the first pulse portion, the beam directed toward an object for generating an X-ray object image; and

selectively transmitting the X-ray object image in response to the second pulse portion.

11. (Original) The method of claim 10 wherein generating an X-ray beam in response to the first pulse portion includes applying the first pulse portion to an X-ray source that in response generates the X-ray beam.

12. (Previously presented) The method of claim 10 wherein selectively transmitting the X-ray object image in response to the second pulse portion includes applying the second pulse portion to an X-ray time gate.

13. (Previously presented) The method of claim 10 wherein the object image is transmitted by an X-ray time gate, the method including combining the object image and the second pulse portion at the X-ray time gate.

14. (Previously presented) The method of claim 10 including generating an imaging beam with a Raman generator in response to the X-ray beam, the imaging beam directed toward an object for generating an object image

15. (Original) The method of claim 10 wherein the object for which an image is generated is human tissue.

16. (Original) The method of claim 10 including, after capturing a first object image:

administering a contrast agent to the object;

capturing a second object image; and

comparing the first and second captured object images.

17. (Original) The method of claim 16 wherein the comparing includes subtracting or dividing the pixels of one object image from the pixels of the other object image.

18-26. (cancelled)

27. (Previously presented) An X-ray radar apparatus, comprising:

an electromagnetic pulse source;

a beam splitter splitting a pulse from the electromagnetic pulse source into a first portion and a second portion;

an X-ray source generating a beam in response to the first pulse portion, the beam directed toward an object for generating a reflective X-ray object image; and

an X-ray time gate capturing the reflective X-ray object image in response to the second pulse portion.

28. (Cancelled)

29. (Previously presented) The apparatus of claim 27, further comprising a delay path, wherein the second pulse portion travels through the delay path to arrive at the X-ray time gate.

30. (Previously presented) The apparatus of claim 29, wherein the delay path is adjustable such that the X-ray time gate captures the reflective X-ray object image associated with a selected object depth.

31. (Previously presented) The apparatus of claim 27, wherein the laser produces a pulse having a width of about 10 – 30 femtoseconds and an energy of at least 125 – 250 mJ at a rate of about 100 – 250 pulses per second.

32. (Previously presented) The apparatus of claim 27, wherein the X-ray source comprises a laser-produced-plasma X-ray source.

33. (Previously presented) A method for examining an object using an X-ray beam, comprising:

generating an electromagnetic pulse;

splitting the pulse into a first portion and a second portion;

generating the X-ray beam using the first pulse portion;

directing the X-ray beam toward an object; and

capturing a reflective X-ray object image associated with a selected object depth with an X-ray time gate that is responsive to the second pulse portion.

34. (Previously presented) The method of claim 33, wherein selectively capturing the reflective X-ray object image comprises selectively delaying the second pulse portion based on the selected object depth.

35. (Previously presented) The method of claim 33, wherein the X-ray time gate selectively transmits the reflective X-ray object image in response to the second pulse portion.

36. (Previously presented) The method of claim 33, wherein the X-ray time gate selectively amplifies the reflective X-ray object image in response to the second pulse portion.

37. (Previously presented) The method of claim 33, further comprising:

defining at least a first selected object depth and a second selected object depth; and

capturing a first reflective X-ray object image and a second reflective X-ray object image associated with the first selected object depth and the second selected object depth, respectively.

38. (Previously presented) The method of claim 37, further comprising storing the first reflective X-ray object image and the second reflective X-ray object image.